

## WHAT IS CLAIMED IS:

1. A projector comprising:

an illumination optical system for emitting a light;

5 an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

a projection optical system for projecting a modulated light generated by the electro-optical device; and

10 an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system, the rock crystal member being disposed not to change a polarizing state of light passing through the rock crystal member.

2. A projector comprising:

15 an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

a projection optical system for projecting a modulated light generated by the electro-optical device; and

20 an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system,

wherein the rock crystal member is disposed in such a manner that a Z axis of the rock crystal is substantially perpendicular to a center axis of a linear polarized light passing through the rock crystal member and that the  
25

Z axis of the rock crystal is substantially parallel to or substantially perpendicular to an electric vector of the linearly polarized light.

3. The projector in accordance with claim 2, wherein the light passing through the rock crystal member is linearly polarized light, and

5 the rock crystal member is disposed in such a manner that the Z axis of the rock crystal is substantially parallel to or substantially perpendicular to an electric vector of the linearly polarized light.

4. A projector comprising:

an illumination optical system for emitting a light;

10 an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

a projection optical system for projecting a modulated light generated by the electro-optical device; and

15 an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system,

wherein the rock crystal member is disposed in such a manner that a Z axis of the rock crystal is substantially parallel to a center axis of a light passing through the rock crystal member.

20 5. A projector comprising:

an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

25 a projection optical system for projecting a modulated light generated by the electro-optical device; and

an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system,

wherein the optical component comprises:

5 a rock crystal substrate as the rock crystal member; and

a polarizing plate provided on the rock crystal substrate,

wherein a Z axis of the rock crystal substrate is set to be substantially parallel to a surface of the substrate, and the polarizing plate is provided on the rock crystal substrate in such a manner that a

10 polarization axis of the polarizing plate is substantially parallel to or substantially perpendicular to a Z axis of the rock crystal.

6. The projector in accordance with claim 5, wherein

the optical element is a polarizing plate, and

the polarizing plate is provided on the rock crystal substrate in such

15 a manner that a polarization axis of the polarizing plate is substantially parallel to or substantially perpendicular to a Z axis of the rock crystal.

7. A projector comprising:

an illumination optical system for emitting a light;

20 an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

a projection optical system for projecting a modulated light generated by the electro-optical device; and

an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path  
25 including the illumination optical system and the projection optical system,

wherein the optical component comprises:

a rock crystal substrate as the rock crystal member; and

an optical element provided on the rock crystal substrate,

wherein a Z axis of the rock crystal substrate is set to be

5 substantially perpendicular to a surface of the substrate.

8. A projector comprising:

an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from  
the illumination optical system in response to image information; and

10 a projection optical system for projecting a modulated light  
generated by the electro-optical device, wherein

the electro-optical device has a pair of substrates,

at least one of the pair of substrates is a rock crystal

substrate composed of rock crystal, and

15 a Z axis of the rock crystal substrate is set to be substantially  
parallel to or substantially perpendicular to a surface of the substrate.

9. A projector comprising:

an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from

20 the illumination optical system in response to image information;

a projection optical system for projecting a modulated light  
generated by the electro-optical device; and

an optical component having a rock crystal member composed  
of rock crystal, the optical component being located in an optical path

25 including the illumination optical system and the projection optical system,

wherein the rock crystal member is a lens.

10. A projector comprising:

an illumination optical system for emitting a light;

5 a color light separation optical system that divides the light emitted from the illumination optical system into first through third color lights respectively having three color components;

first through third electro-optical devices that modulate the first through the third color lights divided by the color separation optical system in response to image information, so as to generate first through  
10 third modulated lights;

a color light composition optical system for combining the first through the third modulated lights;

a projection optical system for projecting composite light output from the color light composition optical system; and

15 an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system, the rock crystal member being disposed not to change a polarizing state of light passing through the rock crystal member.

20 11. A projector comprising:

an illumination optical system for emitting a light;

a color light separation optical system that divides the light emitted from the illumination optical system into first through third color lights respectively having three color components;

25 first through third electro-optical devices that modulate the

first through the third color lights divided by the color separation optical system in response to image information, so as to generate first through third modulated lights;

a color light composition optical system for combining the  
5 first through the third modulated lights;

a projection optical system for projecting composite light output from the color light composition optical system; and

an optical component having a rock crystal member composed of rock crystal, the optical component being located in an optical path  
10 including the illumination optical system and the projection optical system,

wherein the rock crystal member is disposed in such a manner that a Z axis of the rock crystal is substantially perpendicular to a center axis of a linearly polarized light passing through the rock crystal member and that the Z axis of the rock crystal is substantially parallel to or substantially  
15 perpendicular to an electric vector of the linearly polarized light.

12. The projector in accordance with claim 11, wherein the light passing through the rock crystal member is linearly polarized light, and

the rock crystal member is disposed in such a manner that the Z axis of the rock crystal is substantially parallel to or substantially  
20 perpendicular to an electric vector of the linearly polarized light.

13. A projector comprising:

an illumination optical system for emitting a light;

a color light separation optical system that divides the light emitted from the illumination optical system into first through third color  
25 lights respectively having three color components;

first through third electro-optical devices that modulate the first through the third color lights divided by the color separation optical system in response to image information, so as to generate first through third modulated lights;

5                   a color light composition optical system for combining the first through the third modulated lights;

                  a projection optical system for projecting composite light output from the color light composition optical system; and

                  an optical component having a rock crystal member composed  
10 of rock crystal, the optical component being located in an optical path including the illumination optical system and the projection optical system,

                  wherein the rock crystal member is disposed in such a manner that a Z axis of the rock crystal is substantially parallel to a center axis of a light passing through the rock crystal member.

15           14.   A projector comprising:

                  an illumination optical system for emitting a light;

                  a color light separation optical system that divides the light emitted from the illumination optical system into first through third color lights respectively having three color components;

20                   first through third electro-optical devices that modulate the first through the third color lights divided by the color separation optical system in response to image information, so as to generate first through third modulated lights;

                  a color light composition optical system for combining the  
25 first through the third modulated lights; and

a projection optical system for projecting composite light output from the color light composition optical system,

wherein at least one of the color light separation optical system and the color light composition optical system comprises an optical component, and

the optical component comprises:

a rock crystal member composed of rock crystal; and

a selector film formed on the rock crystal member to select light having wavelength in a predetermined range.

10 15. A projector comprising:

an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from the illumination optical system in response to image information;

15 a projection optical system for projecting a modulated light generated by the electro-optical device; and

an optical component having a rock crystal substrate composed of rock crystal and a polarizing plate provided on the rock crystal substrate, the optical component being located in an optical path including the illumination optical system and the projection optical system.

20 16. A projector comprising:

an illumination optical system for emitting a light;

an electro-optical device for modulating the light emitted from the illumination optical system in response to image information; and

25 a projection optical system for projecting a modulated light generated by the electro-optical device,



wherein the electro-optical device has a pair of substrates,  
at least one of the pair of substrates is a rock crystal  
substrate composed of rock crystal.